



Hacker Industries, Inc.

1. Product Name

Hacker Floor Underlayments
 FIRM-FILL® Gypsum Concrete
 FIRM-FILL® 2010
 FIRM-FILL® 3310
 FIRM-FILL® High Strength
 FIRM-FILL® 4010
 GYP-SPAN® Radiant
 Hacker Sound Mat II
 Hacker Floor Primer

**Note: For corrugated steel deck and cementitious applications, consult FIRM-FILL® CMD and TRUE-SCREED® CLU Spec Data Sheets.*

2. Supplier

Hacker Industries, Inc.
 1600 Newport Center Drive, Suite 275
 Newport Beach, CA 92660 USA
 Phone (949) 729-3101
 (800) 642-3455
 Fax (949) 729-3108
 (800) 906-8548
 www.HackerIndustries.com
 e-mail: info@HackerIndustries.com

3. Product Description

BASIC USE

Hacker Floor Underlayments (HFU) are lightweight, high-strength, durable, non-structural cementitious underlayments for use in residential, multi-family, commercial, and radiant heating projects for both new construction and renovation. Trained, Licensed Applicators can install between 500 and 40,000 sq. ft. (46 - 3716 m²) per day. The finished products provide a superior crack-resistant surface that is sound and fire-resistant.

Since 1983, Hacker Industries, Inc. has provided the most cost effective and high strength underlayments in the industry. With the proven performance of 2 billion sq. ft. installed nationwide, HFU are appropriate for use over concrete, wood, steel deck, or radiant substrates. With proper preparation, virtually any type of finished floor covering can be installed over HFU. All HFU meet ASTM F2419, Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments (See Technical Data).

COMPOSITION & MATERIALS

FIRM-FILL® Gypsum Concretes and GYP-SPAN® Radiant are mixed with washed plaster or masonry sand, per ASTM E11, and potable water to form HFU.

TYPES

- **FIRM-FILL® Gypsum Concrete** Designed for use in multi-family housing to attain sound and fire ratings. 1200-2000 psi (8.3-13.8 MPa).
- **FIRM-FILL® 2010** Additional surface hardness and higher compressive strength. 1600-2500 psi (11-17.2 MPa).
- **FIRM-FILL® 3310** An exceptionally smooth, rock-solid, surface over wood subfloors. 2000-3300 psi (13.8-22.8 MPa).
- **FIRM-FILL® High Strength** For resurfacing damaged, uneven or cracked concrete floors and planks. 2500-3800 psi (17.2-26.2 MPa).
- **FIRM-FILL® 4010** Offers superior bonding capabilities for thin capping of concrete floors. 3500-5500 psi (24.1-37.9 MPa).
- **GYP-SPAN® Radiant** Designed for use with radiant heat systems; enhanced thermal mass and heat transfer. 2000-3200 psi (13.8-22.1 MPa).
- **Hacker Sound Mat II** Sound abatement mat; composed of 100% recycled rubber; dramatically increases STC and IIC ratings.

APPLICATION THICKNESS

Minimum application thickness of HFU is:

- Over wood – 3/4" (19mm) of HFU.
- Over concrete slabs – HFU may be feather edged in transition areas.
- Over radiant heat tubes – Minimum 3/4" (19mm) on top of radiant tubes.
- Over Hacker Sound Mat II - Minimum 1" (25.4mm) of HFU.
- Maximum thickness – 3-1/2" (89mm).

LIMITATIONS

- Do not use HFU in exterior locations.
- HFU require a finished floor covering.
- Gypsum based systems shall not be used below grade, or where prolonged exposure to moisture is likely.
- HFU above crawl spaces must be protected by a vapor barrier.
- Subfloor must support design loads with maximum L/360 deflection.
- Do not apply less than 1-1/2" (38mm) of HFU on plastic vapor barrier.
- HFU are but one component of an effective sound and fire control system. Care must be taken in the installation of all components to assure the ultimate design performance. Published acoustical and fire system tests were conducted under controlled laboratory or field conditions and reflect results applicable only to those specific assemblies.

4. Technical Data

APPLICABLE STANDARDS

- ASTM F2419 Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and the Preparation of the Surface to Receive Resilient Flooring
- ASTM C472 Modified Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete
- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials

2008 Tile Council of North America Handbook - Installation Methods F180, F200, RH111, and RH122.

WEIGHT

- FIRM-FILL Gypsum Concrete – 3/4" (19 mm) thickness weighs 7 psf (34.2 kg/m²)
- FIRM-FILL 2010 – 3/4" (19mm) thickness weighs 7.2 psf (35.2 kg/m²)
- FIRM-FILL 3310 – 3/4" (19mm) thickness weighs 7.6 psf (37.1 kg/m²)
- FIRM-FILL High Strength – 3/4" (19 mm) thickness weighs 7.7 psf (37.6 kg/m²)
- GYP-SPAN Radiant – 1-1/2" (38mm) thickness weighs 14.6 psf (71.3 kg/m²)

DENSITY

105 - 130 pcf (1682 - 2082 kg/m³) minimum dry density

APPROVALS

- ICC-ES Legacy Report ER-4147
- City of Los Angeles RR No. 24540
- Metropolitan Dade County, Florida #96-0516.03
- U.S. Department of Housing and Urban Development FHA-HUD-1255

FIRE PERFORMANCE

HFU are included in 86 UL listings: G565, J917, J919, J920, J924, J927, J931, J957, J966, J991, J994, K906, L001, L004, L005, L006, L201, L202, L206, L208, L209, L210, L211, L212, L501, L502, L503, L504, L505, L506, L507, L508, L509, L510, L511, L512, L513, L514, L515, L516, L517, L518, L519, L520, L521, L522, L523, L524, L525, L526, L527, L528, L529, L530, L532, L533, L534, L535, L536, L537, L538, L539, L540, L541, L542, L543, L544, L545, L546, L547, L548, L549, L550, L551, L552, L553, L555, L556, L557, L558, L559, L560, L562, L563, L571, L585, L598.

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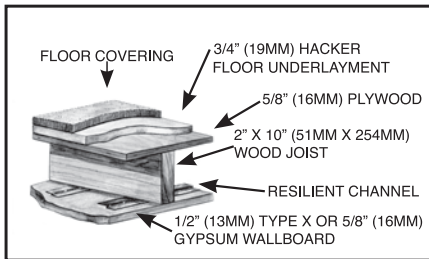


Figure 1: Wood System

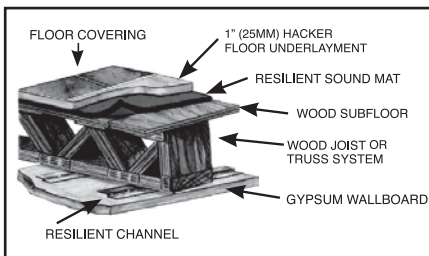


Figure 2: Sound Mat

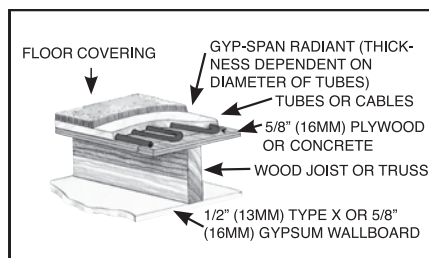


Figure 3: Radiant System

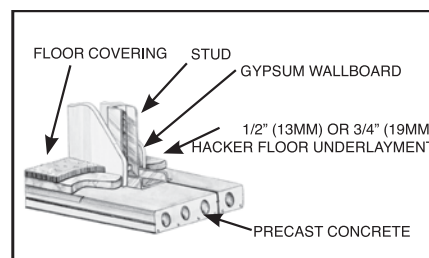


Figure 4: Concrete System

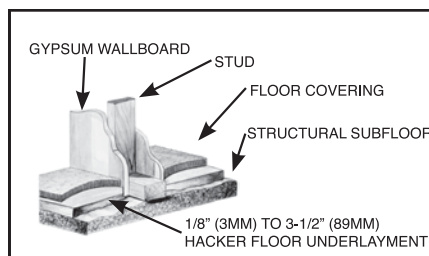


Figure 5: Renovation

THERMAL PERFORMANCE - ASTM C177:

- FIRM-FILL Gypsum Concrete: K-value of 2.45 Btu/(ft²•h•°F)[4.2W/(m•k)]; R-value of .41 ft²•h•°F/Btu (.07m²•K/W)
- FIRM-FILL 2010/FIRM-FILL 3310: K-value of 2.8 Btu/(ft²•h•°F)[4.8W/(m•k)]; R-value of .36 ft²•h•°F/Btu (.06m²•K/W)
- FIRM-FILL High Strength: K-value of 3.34 Btu/(ft²•h•°F)[5.8W/(m•k)]; R-value of .30 ft²•h•°F/Btu (.5m²•K/W)
- GYP-SPAN Radiant: K-value of 4.35 Btu/(ft²•h•°F)[7.5W/(m•k)]; R-value of .23 Btu/ft²•h•°F(.04m²•K/W)

FIRE HAZARD CLASSIFICATION

ASTM E84: Flamespread Index, 0; Fuel Contribution, 0; Smoke Density, 0.

ACOUSTICAL PERFORMANCE

HFU contribute to superior STC (Sound Transmission Class) and IIC (Impact Insulation Class) ratings. Additional sound reduction is achieved using a HFU and Hacker Sound Mat II.

5. Installation**SITE CONDITIONS**

HFU shall be delivered in original, unopened bags, stored away from exposure to elements, and at a temperature above 50°F (10°C). Do not allow bags to get wet.

Building temperature shall be maintained above 50°F (10°C) before, during, and after installation until the subfloor, ambient temperature, and humidity have stabilized and material has completely dried.

PREPARATION

General Contractor shall confirm the subfloor is structurally sound and conditions are suitable for installation of floor underlayment. Limit design of the subfloor at a maximum of L/360. Subfloor must be dry, broom cleaned, and completely free of oil, grease, paraffin, wax, laitance and other contaminants. Subfloor shall be tested for moisture before the installation of HFU.

APPLICATION

Prior to installation of HFU, the building must be enclosed including roof, windows, and doors. Install HFU after radiant heat tubing has been put in place. Provide constant ventilation to remove moisture from the area until the underlayment is completely dry.

The following tests shall be performed in conjunction with the installation of HFU:

Field Samples: Perform psi tests in strict

accordance with ASTM modified C472 using 2" (51mm) split brass molds.

Slump Test: Test for slump as HFU are being installed using a 2" (51mm) by 4" (102mm) cylinder and plexiglass. The patty size shall be as specified by Hacker Industries, Inc.'s most current literature.

Dryness Test: Prior to the installation of finished floor goods, Hacker Industries, Inc. recommends that a moisture test be done. Recommendations for methods of testing for moisture shall be provided by the floor covering manufacturer or contractor. Calcium Chloride is not an approved method.

PROTECTION

During construction, General Contractor shall place temporary wood planking in areas subject to wheeled traffic or concentrated loads.

BUILDING CODES

Installation of HFU must comply with applicable local, state, and national code requirements.

6. Availability & Cost

HFU are only installed by Licensed Applicators. Contact Hacker Industries, Inc. for the applicator(s) in your area.

7. Warranty

Hacker Industries, Inc. warrants HFU to be free from manufacturing defects, and when properly prepared and installed according to approved specified methods, HFU will attain minimum physical specifications as stated by Hacker Industries, Inc.'s most recent literature. Hacker Industries, Inc.'s obligation shall be limited to the replacement of the bagged product only and is subject to notice and inspection requirements.

This warranty is in lieu of all other warranties expressed or implied including the warranties of merchantability and fitness for a particular purpose and all other obligations or liabilities.

8. Maintenance

None should be required.

9. Technical Services

For design and technical support, contact Hacker Industries, Inc. at (800) 642-3455.

10. Filing Systems

- Reed First Source™
- Sweet's Catalog Files
- www.HackerIndustries.com